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A NEW FIXING AGENT.

R. ED. LIESEGANG.[1]

THIOSINAMIN is one of the few substances possessing the property of dissolving the silver haloids. Consequently it is available as a substitute for hyposulphite of soda for fixing purposes in photographic manipulations.

Cyanide of potassium, a most excellent dissolver of the silver haloids, is debarred from practical modern photography on account of its extreme poisonous properties.

In ammonia the strong odor is objectionable, independent of the fact that it attacks the paper as well as the medium or sizing material. Alkaline chlorides and the chlorides of a few metals dissolve chloride of silver, but only to a limited degree.

Sulphocyanide of potassium, to which his father (Dr. Liesegang) first called attention, cannot be applied for the purpose, as the resulting sulphocyanate of silver is again precipitated upon washing in water.

Consequently at present hyposulphite of soda is almost exclusively in use as a fixing agent. Attention is called almost daily to the undesirable properties of hypo. The least quantity of acid liberates sulphur, the extreme harmful action of which upon the

[1] Read before the second annual meeting of the World's Photographic Society at Genf, August, 1893 (translated by JULIUS F. SACHSE.)

silver image is but too well recognized. Then frequently, with even the greatest care to overcome the decomposition and sulphur-toning, it still depends upon sufficient washing to remove every trace of the undecomposed salt.

Any fixing agent which would overcome at least one of these difficulties, certainly would be a desideratum. Thiosinamin seems, so far as I have been able to gather from my preliminary experiments, to be free from both disadvantages. It is an organic substance, represented by the following formula ($CS\ NH_2\ NH\ C_3H_5$), which results from a combination of ammonia with the volatile oil of mustard. This compound is also known as "uric sulpho-cyanate of allyl" ("allyl-sulpho-urea"). In combination the substance crystallizes in colorless, non-odorous crystals, which are soluble in water and alcohol.

The aqueous solution dissolves the argentic chloride as rapidly as hyposulphite of soda. With argentic bromide the new agent acts a trifle slower than hypo, but equally complete.

Silver chloride paper prints are fixed thoroughly in four minutes by the use of a one per cent. solution. If we add to the fixing bath 0.1 per cent. chloride of gold, we obtain a simple and rapidly-acting toning and fixing bath. Aristo pictures treated in this manner have far greater depth than platinotypes.

For warm tones the quantity of gold is to be reduced. Thiosinamin may be combined with an equal quantity of concentrated muriatic or other acids without decomposing the salt or affecting its fixing properties. Naturally I do not advise the use of strong acid solutions in practice, but merely wish to call attention to the great advantages the new agent possesses over hypo.

A combination with alum or sodium chloride is also feasible. An alkali, which by the way is absolutely unnecessary, is not to be brought out into contact with the new agent. A solution of this character would blacken the unexposed argentic chloride or bromide, and make it insoluble.

Nothing definite can as yet be said regarding the permanency of the prints fixed with thiosinamin which have been insufficiently washed, although prints which after fixing were merely rinsed off with water, have now after twenty days failed to show the least

deterioration. Should this test prove conclusive for the future, it would be another great advantage over hypo.

At present the cost of thiosinamin is against its general intro duction (a kilogramme—2¼ lbs.—costing 96 marks or about $24.00). However, there exists no reason why, with a large demand, the price should not be materially reduced.

HINTS ON LANTERN MANIPULATION.

Working the Optical Lantern with Oil.—The tyro, who first acquires and then wishes to use his lantern, will doubtless welcome a few suggestions as to his method of procedure. We will suppose that he knows nothing of the lantern and its ways, but has bought one, and has asked his domestic circle to be present at his inaugural show. Well, we advise him to "don't." Just get into the way of manipulating your instrument first, and then invite a crowd if you like.

Now, having blocked up your lantern before the screen,—of which and how to do it more later,—so as to have the lens about level with the middle of the screen. Take out the lamp, and fill it with the best water-white oil, carefully wiping it all round, and especially under the rods which regulate the wicks. Light the wicks, and see that they burn evenly; if not, trim them first level with the tubes, and then just take off the corners. Or you may make the lamp trim itself, by moistening the tops of the wicks (when the lamp is empty) with oil, turning them down nearly level with the tubes, lighting them, and allowing them to burn themselves out and level; then just brush off the ends with a card, and they will be trimmed far better than with scissors.

Having lighted your lamp, place it in position in the lantern, turned down so as to just keep the whole edge of each wick alight, raise the chimney as high as it will go, and leave the whole thing for a quarter of an hour to warm through. Then gradually turn up the wicks and uncover the lens. Slide the lamp backwards and forwards in the lantern until the screen

is evenly illuminated. The wicks should be turned up until the lamp begins to smoke, and then turned down just below that point.

KEEP A DOOR OR WINDOW OPEN when working an oil-lamp, otherwise, in a close room, the lamp is sure to smoke. After the show is over, turn out the lamp, and when cool remove from lantern, empty out the oil, and light the wicks again, allowing them to trim themselves as before, and to burn out all the oil from the lamp. Oil left in a lamp causes the wicks to get hard, and therefore burn in a less efficient manner, besides getting all over the lamp, and causing a disagreeable smell when the lamp is lighted.

ADD A LUMP OF CAMPHOR, about the size of a walnut (to a pint of oil), as it greatly increases the whiteness of the flame, its only disadvantages being to clog the wicks to a certain extent; but being a volatile substance, if the wicks are taken out and exposed to the air occasionally, very little camphor will be left. Do not add naphthalene, or albo-carbon as it is called, for it causes most lamps to smoke abominably, unless, like a recent invention, the draught can be increased to prevent smoking by racking the chimney further out.

LANTERN SCREENS can be bought on rollers, or folded up to attach to a frame. For ordinary use in a dwelling-house, an eight-feet or nine-feet screen is amply big enough, and for oil certainly too big. With oil, be content with a well-illuminated five-feet disc, rather than a poorly-lighted eight-feet one; but for a blow-through, yet properly managed, a twelve-feet screen is by no means too large. However, we will suppose the sitting-room is to be the scene of operations, and therefore an eight-feet screen will well meet the case.

Now, there are screens and screens, and the best of all, bar none, is not a screen at all, but a flat, white-washed wall. But that is not ornamental nor portable, and therefore we advise the tyro to buy an opaque screen, fitted with rollers and pulleys. We have one in our room, a fixture, and by arranging a cornice

over it, or, under a curtain-pole, it is not unsightly. The convenience is astonishing, as the cord only wants slacking for the screen to unroll itself and be ready. The ordinary domestic sheets or the folding linen screens are troublesome to fix up, require stretching, get dirty, and must have a frame, besides letting through a lot of light, which is thus lost. Mason & Payne's screens are good, but have to be rolled up by hand. If the makers would only fit them with pulleys and cords they would be far more convenient.

Do not hang your screen anywhere near a fire, as it will cockle up, and (if one we know can be taken as a criterion) nothing will ever make it go flat again. The effect of such a screen on architectural subjects is diverting to the "visience" (Andrew Pringle, ahem!), annoying to the lanternist, but heart-breaking to the slide-producer.

If the Lantern is Tilted, the Screen Must Be Tilted.—The axis of the lens should meet the centre of the screen normal to the surface. Therefore, if the lantern is tilted upwards, the screen must lean forward at the top. The motto is easy to remember, and holds good for other things[1] besides screens. "Upwards and forward, or downwards and backwards." If the screen is fixed at the top, the tilt can be effected by fixing the bottom roller—backward or forward as the case may be. Now, having our screen fixed up, the next thing is the support for the lantern.

Lantern Stands.—The usual way is to place the lantern-box on a table on its side, and the lantern on the box, and this serves the purpose fairly well. If, however, a board be hinged to the back of the box, and on its two sides a slot-plat be fixed, working into a screw-bolt on each side, tilting is most easily regulated. The board should be changed to avoid warping. In fact, ours is a cheap clamped drawing-board, stained to match the lantern-box.

We generally use in place of this arrangement of table and box a studio-stand, which we bought for copying purposes. On the top we have hinged another drawing-board, and we find this

stand most useful, not only for the lantern, but for working our reducing camera, and for copying purposes, as the board will tilt up vertically if necessary.

Distance Between Lantern and Screen.—Fidgeting the lantern and its paraphernalia up and down in front of the screen, in order to find the correct distance, is a sort of cumbersome minuet, and by no means scientific. Now, for first principles: The size of a lantern-slide when masked is, say, three inches square, and we want an eight-feet picture, not disc. The linear enlargement is, therefore, thirty-two times, and we have the distance from lens to screen at once from that ever-useful formula:

$$V = (n + 1) F.$$

Say we are using a five-inch lens (of course we mean focal length five inches).

V = Distance.
N = No. of times enlargement.
F = Focal length of lens.

We get $V = 33 + 5$ inches.
13 feet nine inches.

We, therefore, step four and a half good paces from the screen, and place our lantern there, and know we are about right.—*Photography Annual.*

Fish Oils.—The examination of a number of different fish oils demonstrates that the solid fatty acids are made up in the main of palmitic acid, with small quantities of stearic acid; the liquid fatty acids are not identical with any of the known acids: Asellic acid, C 17 H 32 O 2, and jecoric acid, C 18 H 30 O 2, isomeric with linolenic acid, to which the easy oxidation of the oils is due; both of these acids are oxidizable by alkaline permanganate of potassium solution, yielding characteristic oxy-acids; the ultimate analysis of the oxy-jecoric acid gave results indicating the presence of a third acid, possibly isomeric with linolic acid.—*Dr. W. Fahrion, Chemiker Ztg.*

MAKE HASTE SLOWLY.

XANTHUS SMITH.

A WRITER in a recent London photographic journal makes reference to two statements which he has seen in American papers, greatly at variance with each other, in regard to the amount of interest manifested in photography by amateurs. One statement is to the effect that the fad photography, has, like the roller skate, about had its day, and that we are no longer to be annoyed at every turn by encountering semi-lunatics with cameras blocking up our way, and stealing hideous misrepresentations of us for themselves and their friends to gloat over. While the other statement presents the encouraging fact that the enthusiastic camera artist is to be seen in increasing numbers, and attests his statement by the fact of the large number of visitors to be seen with cameras at the Columbian Exhibition, notwithstanding the tax which is imposed for admission and use of those valuable aids to the enjoyment of many persons of taste.

We hope indeed that the latter may be the correct view of the matter. That so valuable, yea indeed, so invaluable, an art as the taking of pictures by photography should be treated like many things more or less trivial, which have their day and are then relegated to the past through the mere whim of fashion, is an idea not to be tolerated.

Let us hope that instead of any falling off of interest in the pursuit of photography, its votaries may show that annual increase which the useful and pleasure giving art, as practiced by amateurs, deserves. But, we feel that we may offer a little advice that may perhaps tend to retain those few who may feel that the vexations and disappointments more than counter-balance the enjoyments of the pursuit—and, smooth the way for others who have no notion of relinquishing their favorite pastime, yet are trammeled and disheartened by unnecessary mishaps.

Thoroughness, an excellent motto in any pursuit, goes a great way towards success in photography. The "good enough" theory, and short-hand schemes, with trusting to luck for tiding

over to success, are poor reliances in a business involving a number of nice delicate manipulations in which both mechanical and chemical operations are required. The very shielding of the sensitive plates from the faintest ray of light is a matter requiring the nicest care and attention, and especially so in doing out-door work, where the camera and plate-holders must often be placed so as to be in direct sunshine, making it obvious that the outfit used should be absolutely sound in every respect.

This is the season of the year in particular when we begin to hear the woeful tales of failures, as the summer tourists return from their sojourns amongst the beauties of nature, which their efforts to harvest have run them into expense and disappointment only. One has made snap shots by hundreds in the lake region and has not got above a dozen pictures which are presentable, and those are rather an eyesore than otherwise. Worthless films, is the tale of apology which must go with them. Another has encumbered himself on his seashore trip with an eleven by fourteen outfit and good luck having thrown much that was fine in his way, especially in yachts under sail, he expected to reap a rich harvest, but finds all his efforts destroyed and hopes frustrated through an imperfect bellows to his camera. "Light-struck" must be his brief apology. Another has over-exposed all his plates, and so it goes, and, we must say by the way, that bad as these near-home experiences are, they are trifling as compared to those of the excursionist to Europe or to Alaska who has provided himself without due care at the outset.

Such experiences as these might indeed be enough to wean the faint-hearted from the art, and deter the uninitiated from venturing into its realms of interest and beauty, were it not that there is another side to the picture.

Let us take the careful thorough-going man or woman. They will have provided themselves with a thoroughly good outfit, not necessarily an expensive one, but so well made that it fulfils reliably the purposes for which it was constructed, and will have given it sufficient trial to assure themselves that it is as represented. Then, also, before setting off any extended trip they will have made trial of the films or brand of plates to be used

thus avoiding the chances of foggy, spotty and otherwise worthless sensitive grounds, and in addition, determining a matter of much importance, namely, their sensitiveness, thus obviating the dangers of under or over exposure.

The keeping within certain bounds both by the manufacturers of photographic materials and the consumers of the same will do much towards maintaining the art of amateur photography on a sound and increasing business footing.

Manufacturers of dry plates and films should be especially careful not to let bad lots go from their works. A perfectly reliable plate, even highly sensitive and which will keep indefinately, under proper conditions, has been made for years consecutively, and we do not see why it should not be possible to continue to make them. This cry that highly sensitive plates will not keep is something new to us.

Suppose that hundreds of yards of worthless films are put in hundreds of attractively gotten up, but indifferent cameras, and carried over the country by enthusiastic amateurs, who fire away indiscriminately at whatever attracts their attention, whether it be pictorial, or in any way at all suitable to be photographed, and when it comes to the developing of all this work, it is found that nine-tenths of it is absolutely worthless, the larger part of it indeed simply a blank gray fog, must it not tend strongly to a depreciation of the business of amateur photography, and especially when it is taken into consideration that a large part of this unproductive work is developed, not by the amateurs themselves, but by professionals, and at very considerable expense to the amateurs. Those only who have the experience, know how exasperated persons will become when they find that they must pay for the developing of a number of plates or films upon which no printable image has been brought forth.

Let us council a more slow and thorough mode of procedure. Let the manufacturers bestow a conscientious care upon what they make, and test carefully its merits before sending it forth and take no risks as to whether a camera and its holders will answer or not, or whether an emulsion will fog or not. Let them be quite certain that under proper treatment it does not fog.

And, on the part of the amateurs, let them go about the business of photography with great pains. Let them not feel that making pictures with the camera must be practiced in such a wholesale way, at least until a great degree of certainty has been reached by them. Let them take rather fewer pictures and devote more attention to the nature of the subject, thereby making the art a profit and a delight.

Failures there must be and many, as the most experienced know, even professional photographers are not exempt from the trials of bad emulsions and under and over exposures. But let such be kept in the minimum. We should not get to feel that it must be a matter of course for us to set off on a photographic expedition and make several hundred exposures and be repaid simply by a few miserable, spotted, and befogged negatives.

Luck will often go a great way, but in the practice of photography it will not do to rely too far upon the good nature of this goddess, or we may find ourselves cast into the deepest gloom of disappointment.

Nature's Mimicry.—Curious resemblances in nature start with the cocoanut, in many respects like the human skull and almost a facsimile of the monkey's. The meat of the English walnut is almost a copy of the human brain, plums and black cherries like the human eye, almonds like the human nose, and an opened oyster and shell a perfect likeness of the human ear. The shape of a man's body may be traced in the mammoth squash, the open hand in growing scrub willows and celery, the human heart in German turnips and egg-plant, and dozens of the mechanical inventions of the present day to patterns furnished by nature. Thus the hog suggested the plow, butterfly the door-hinge, the frog-stool the umbrella, the duck the ship, and the fungus growth on trees the bracket.—*Petit Journal des Sciences.*

There has been some talk of organizing a photographic league composed of newspaper men who use the camera as a means of pleasure. There are a number of camerists on the daily press hereabouts, and if combined would make a very interesting association.

CARBON PRINTING.[1]

W. A. COOPER, CHICAGO.

IT IS pretty well admitted that the first print made in the camera was by Niépce, in 1816, twenty years before daguerreotypes were made, and nine years before these great inventors met. In 1825, then, we have the record of the first "World's Congress of Photographers." What grand results have been accomplished as the outcome of that meeting. Who can tell but some of the prophesies now made, thoughts expressed at this congress may have as literal a fulfillment as the prophesies of our great forerunners in our beloved art.

A little camera, 6 by 6, fitted with a telescope tube containing a lens pointed at a pigeon-house, a sheet of white paper drawn through the salts of silver and exposed to broad sunlight, and we have the first print ever made (or more properly speaking) the first negative, as the lights and shadows were inverted and the image reversed. From this little experiment in the garden of Niépce, must we date the birth of one of the greatest discoveries of this century. Without following the child through the stages of improvements in all the various printing processes up to the present time, I will plunge at once into the subject I am to talk to you about to-day—carbon printing in relation to reproductive art and as a necessity in the studio of every photographer.

Time was when permanency was not questioned. It was not thought of in 1816, the main thing then was to "get the image." "How to fix it" was the next great question, and with all the varied processes before us, with the perfection in the making of negatives, the great strides to the photographing of different colors, and getting their values, the vital question should be, what process shall we use that will give the best results, and that can be handed to future generations with some degree of faith that they will endure. That the carbon is permanent is beyond question. That it is adapted to the reproductions of works of art, I only have to point you to thousands of samples in this building,

[1]Read at the Congress of Photographers.

some 18,000 having been recently purchased by the Art Institute from Braun & Co., of Donrocks, and their line not half exhausted; and all through the land our schools and colleges are filled with these beautiful samples.

It is only the few who can possess a Reubens, a Ralph-Sanzeo, a Titian, or the works of the great painters of our own day. But Braun of France, and the Autotype Company of England, have made it possible for us to have copies of these masters as permanent as a veritable Reubens, and the demand is increasing.

In 1880 reproductions by any of these processes were practically unknown throughout the great West. It was the day of cheap chromos and paintings by the yard. These made way for the beautiful "Autotype," the first photo-mechanical process to reproduce works of art in this country commercially. These grew rapidly in favor, because, being actual photographs in printing ink copied from modern paintings and engravings, and very cheap, so the chromos and the daubs, called oil paintings, were driven out, and the homes of the poor and out great middle classes were filled with beautiful copies of the "Angelus," "Christ in the Temple," and hundreds of other great works.

Then began to appear autotypes of the last Salon—and of the masterpieces in the Louvre, the Luxemborg, the Vatican, and the public and private galleries of Italy and England.

To show the achievement of photography in this particular channel, and especially to prove what the carbon process has done, let me call your attention to a few pictures in this hall—these beautiful carbon prints, and as we see them to-day so may our children's children gaze on them, for we know them to be as permanent as the diamond. Here we have the "Gleaners" by Millet, there a Corot, here a Rosa-Bonheur, now in the Luxemborg, there a Franz Hals and a Rembrandt, a "Beatrice De Cenci," by Guido Reni, a Hans Nemling, a Michael Angelo. "The Beautiful St. Cecilia," by Carlo Dolci, the "Marriage of St. Catherine," by Correggio, a Murillo, a Hans Holbein, and last, the "Children of Charles I.," afterward Charles II. and his sisters, by Van Dyck. These have all been photographed direct from

the originals, so you see we stand very close to these grand old masters. It lacks only the color.

Outside of a chosen few who had means and could travel, who knew or heard of the great French painters, Bouguereau, Gervaise or Meissonier, or a hundred others, until Goupil with his charming photogravures, or Braun with beautiful carbons made their works known the world over? They sprung into notoriety at once, and to-day hundreds of originals are owned in this country.

What Goupil and Braun have done for the French painters may we not do for ours? Art has grown in America very rapidly. It is only necessary to visit the United States section in the Art Gallery at Jackson Park to prove this. Who knows but that the next great school of art will be an American school? I could name a dozen of artists in this country whose works would find a ready sale abroad. Photographers of America, you must be up and doing. The time is not far distant when I hope to see carbon prints of our own artists on the market. I mean prints worthy of the subject, like those I have called your attention to in this hall. To-day in America I know of one or two establishments working this process almost exclusively for portrait work, but I hope soon to see an establishment started in Chicago ostensibly for the reproduction of works of art.

Now as to general studio and view work. In this age of cheap pictures and cheap printing processes, something should be done to bring about better prices, and give permanent results. This is only following out the natural tendency of things. We have gone rapidly ahead in all other branches; why stop where the negative is made and let the cheap and poorly taught help rush the prints through? One only has to compare carbon portraits in any tone with the best prints of any of the processes used to see that the advantage lies with the carbon. It has greater depth of color, is less sharp in outline, consequently more artistic. Its natural condition is matte surface, which is fast becoming popular, showing the growth of taste. It will bring better prices, and just now with prices cut down beyond all reason, the beautiful but evanescent "aristo" advertised at $2 per dozen and sixteen

prints and a life-size bromide for $3, surely the carbon should be hailed as a boon to the photographer and a blessing to the country. Take the copying and enlarging departments alone—what a field for this beautiful and permanent process. Look at the millions of portraits that are copied every year; how many of them are fit to hang in our homes, and how long will they last? Surely the pictures of our loved ones should be permanent. What value would these reproductions of the old make be if in a few short years they would fade?

I make this a strong plea. I believe the time has come to wake up to the folly of using processes for printing our pictures, especially the larger ones, that we know will fade.

The reasons that photographers have not long ere this adopted the carbon process are many. In the first place, we did not begin at the bottom and study the philosophy of gelatine printing. In 1876, the fascinating double transfer process of Johnson was taught and sold in this country, and at first it seemed simple and easy, and only the few succeeded, and those only after going into it thoroughly. Had the old-fashioned, but reliable single transfer process of Swan's been taken up and the photographers satisfied with matte finish, the history of carbon printing in this country would have been different. Unfortunatety, the rage has been for highly burnished or glace finished pictures, and the Johnson double transfer caught them. But I am happy to say to you things have changed, and the great growth of photography among amateurs of the better class have helped to bring it about. Now, the desire is for matt surface in all gelatine printing papers, and to-day in Chicago the pictures that command the highest price are single transfer matt surface prints developed on celluloid sheets, and very beautiful they are.

Now, a few words as to the working of the process: I am using, and I advise all beginners to use simple transfer. It is as simple as making a negative on a dry plate and less complicated than the toning, fixing and washing of one albumen or an aristo print. I wish I could give you an ocular demonstration of the process, that you might see how simple the exposing and developing is, but must content myself by describing as briefly as possi-

ble how to make a carbon print: Provide yourself with one roll of tissue, one roll of single transfer paper, one squeegee, one yard rubber cloth, one pound of bichromate of potash, one photometer, hot and cold water, and the oulfit is complete. Sensitize your tissue in a three per cent. solution of bichromate of potash, by immersion for three minutes, or until it lies perfectly flat, face down, and the edges begin to curl up; place it face down on a piece of glass and squeegee out excess of solution, then place to dry face up, on blotting paper like this ⌒ in a dark dry place. It should dry in about four hours; if it takes longer, your room is damp. When dry cut in sizes and place in tin box and it is ready for use within a day or two at most.

Prove your negative with albumen paper, putting a slip on your photometer and exposing both together, print as you would for a proof—no deeper. Note the number printed on your photometer and that as a rule is the depth to print your carbon. Very simple, is it not? Use a mask on your negative to protect edges of tissue from seeing the light, that they may remain soluable, and adhere closely to transfer paper. Cut a piece of the transfer paper larger than the tissue, and immerse it with exposed print in cold water. When tissue lies perfectly flat, bring face of print and coated surface of transfer paper together under water. Now lift both out together, placing on glass, and with rubber cloth and squeegee squeeze out all air bells and water; leave under weight a few minutes and it is ready for developing. Place the print in warm water of about 75° Fahr., and in a few minutes the gelatine will soften, and the pigment will ooze out; then the paper that had formed the temporary support may be separated by rolling it away, or back, leaving the print on transfer paper. The temperature of water may now be increased up to 90°, 100°, or 120° Fahr., according to depth of print or age of tissue, fresh tissue developing quickly at 90° or 100°, while old sensitized tissued may require 125°, or even more, but as a rule less will do. When developed, plunge in cold water for a minute to stop development, then into a weak solution of alum to take out any bichromate that may remain, and your picture is finished.

This, then, in a nutshell, is carbon printing. One must understand the philosophy of the action of bichromate on the tissue and the action of light on the bichromate, and the whole thing is simplicity itself.

Now in regard to the negative I would like to say a few words. It is ab olutely necessary that a strong, vigorous negative be used, fully timed and carried well along to developing, stronger than for albumen printing. As a reversed negative must be used for single transfer, I wouid recommend for portrait work the use of a prism on your lens; this will give you a reversed negative on glass and may be retouched as in the ordinary way; but for outdoor work and copies of paintings I use orthochromatic stripping plates, without, of course, the use of a prism.

In copying paintings I use a screen back of lens, light yellow or orange according to the picture. In the case of old dark paintings I place them in strong sunlight in a direction that stops all reflection and gives the handling and the technique of the artist. Use a medium stop and give plenty of time—from four to ten minutes.

I shall not attempt to speak of other branches in carbon printing, such as double transfer or transferring on uneven surfaces, or making transparencies, because after getting posted in the single transfer all these will follow. If the amateurs of this country could only realize the beauty and simplicity of this process it would settle the question, because the demand would drive the professional into it for self-protection.

Into your hands then I leave it for the present, and may the seed fall on good ground and end like the story of the flower told so sweetly by Tennyson:

> "Read my little fable.
> He that runs may read;
> Most have got the flower now,
> For all have got the seed."

The sculptured lions on the gates of Mycenæ are believed to date from the ninth century before the Christian era.

POSING AND ILLUMINATION.*

*Read at the Congress of Photographers, Chicago, in August, 1893.

E. M. ESTABROOKE, ELIZABETH, N. J.

IT has devolved upon me to prepare and read before this assembly of artist photographers, a paper on posing and illumination in the photographic studio.

It is a pleasing duty, as portrait photography has been the delightful occupation that has claimed my energies for many years of the past, and I hope the pleasure will still be mine during many years of the future.

The subject of posing and illumination in the photographic studio is more nearly related to the artistic than to the scientific part of photography, and therefore there will naturally be a wider diversity of thought and opinion on the subject than might be expected concerning the more scientific, and therefore more exact branches of our profession, such as are practiced more particularly by the dark room worker or the printer, although there can be no doubt that each of these is successful in accordance with his knowledge of art principles and his ability to apply them in his work.

The successful photographer may well claim to be an artist, for the highest product of his genius must be the exquisite flower of the combination of the purest and most cultivated taste and the highest skill.

The artist, however, they say is born, not made. Nature must first have endowed him with gifts that would have constituted him an authoritative connoisseur in all art matters without having studied either line or rule. The endowment of artistic taste, however, does now carry with it the ability of mechanical expression; taste is of the intellect, inward; mechanical expression is of study and practice, outward.

Taste is God-given; it may be improved by cultivation, but cannot be acquired by study.

Manual skill is only acquired by long and generally painful exertion, and only retained by constant practice.

The artist, therefore, in whatever line (whether as the musician who charms and enraptures us with heavenly sounds, or the painter who enchants us with harmonious colors, or the photographer who delights us with beautiful effects of light and shade), is one who has been impelled to acquire the manual dexterity or skill to give outward expression to the beautiful in sound, or color, or light, whose origin is from within.

All photographers may not be artists in the highest sense, because art is inherent, not acquired; but that which a man has may be improved by study, and observation of the works of artists who have made for themselves a name and reputation as such.

All photographers may and should be students, eager to find out for themselves every means that may enhance the beauty or value of their work.

At no time in the history of art has the study of art principles in the beauty of form, color and shade been so easy or the opportunities so numerous as at the present time, the near ending of the century.

Posing and illumination under the photographer's skylight, or in the painter's studio, must be governed by the same rules, and these rules or laws have so frequently been published in photographers' journals, and have been so frequently commented on by eminent photographers for the instruction of their fellow-workers, that it appears unnecessary on this occasion to occupy time by any detailed discussion thereof. I would strongly recommend the study of the same, and the application of their ideas in your daily work in your studios.

The time is now past when any photographer poses and illuminates any subject without study and consideration.

It is not the rule now to seat your subject carelessly before the camera and fire away, considering that any outcome must be a likeness, and therefore good enough. The light now furnishes the modeling and the lens cuts it in; therefore, the handling of the light and the use of the lens must receive the study and practice that are necessary to the skillful use of the pencil and the brush.

If the artist photographer has any appreciation of the line of

beauty, he will easily understand that in posing his subject under the skylight, he should develop or bring into prominence the curve, rather than the angle, and that the centre of gravity should fall within the base.

He should understand that symmetry and proportion must characterize his work, whether of the one or of the many, the single figure or the group.

He must understand that in composition, lines must have supporting lines when not perpendicular, and that a picture is unsatisfactory that carries no idea of firmness and support.

The artist having these elementary principles constantly in mind, will practically make a study of each face and form that comes under his studio light, viewing the subject or model from every direction, and by every method of illumination; studying the face by front, three-quarter or profile view, both toward and from the light; and also by the various arrangements of the light, such as broad Rembrandt or shallow lighting, or by any recognized method of lighting that the studio will admit of, that may impart character, form or piquancy to a face or figure that may perhaps lack one or all of these graces when in repose, while abundantly interesting when animated by conversation or engaged in the common affairs of life.

Every face will present some one view that will be more pleasing or interesting than any other. The long, thin face may perhaps be more pleasing from the front; the broad face may look better at the three-quarter view; one view may suppress an angle and develop a color, while an inconsidered pose might bring out the reverse.

The tilting of the head to one side or the other, the raising of the chin or the reverse, may give piquancy to this one and picturesque effect to the other.

In this manner he will decide on that view that gives the most pleasing outline, and that method of illumination that gives boldness and brilliancy where features are small or insipid, or that tones down the harshness of a too rugged face without losing altogether its characteristic quality, for it is well to keep in mind that an indication of character adds as much to a portrait as does

action or life to a pose, avoiding always the commonplace. Tameness in expression, pose or lighting is contemptible, and will rob even the finest execution of every charm; at the same time an evident straining for effect in pose or lighting is objecttionable to any refined taste, and should be avoided as strenuously as the other extreme, however true it may be, that the daring innovater may sometimes produce charming effects that may not come strictly within the approval of a too cultivated taste.

In my opinion a resort to ultra effects is only justifiable in cases where the face and form of the subject are not amenable to ordinary methods, and when it may be desirable or profitable to experiment.

When posing a single figure in either full or three-quarters, certain accessories may be used with good effect—but care should be exercised in making the model the central point of attention; everything should be subservient to the portrait.

The three-quarter length will always be better without accessories, unless in a sitting or leaning position, in which case the proper support will necessarily be provided.

Groups of two or more require the exercise of common sense and a knowledge of the capabilities of light and lenses. In form, the group should be as symmetrical as may be, with dark complexions and dresses placed next the light; and in large groups, more attention should be given to the general than to individual effect.

The best photographic light is received from two windows—a top window or skylight joined to a side window, which shall reach to within three feet of the floor of the studio.

The dimension of the skylight should not be less than ten feet square, if space permits, but preferably larger if convenient; the pitch of the upper light only enough to easily and safely carry the snow and ice of winter and shed the rain of summer without leakage.

The quality of the top light is softness and delicacy of detail, but with two heavy shadows beneath projection.

The quality of the side light is vigorous harshness, with abrupt lateral shadows.

The one corrects the other to any extent desired, so that having a top and side light properly shaded with movable curtains, every descriptirn of face may be so lighted as to make prominent all the good points and to lessen or entirely suppress all that is not desirable.

By a proper arrangement of the top and side light we can give boldness and prominence to small or weak features. We can by similar means soften and refine coarse and rugged faces.

By seating the model facing the light, and at a suitable distance therefrom, it is possible to remove to a great extent the appearances of age; the wrinkles and crows-feet are lighted up, but cast no shadows.

In fact, it is possible to change the shape of the face of any subject to a great extent by judicious management of the light.

Having a good light, use all of it that may be used with advantage, according to the method of lighting adopted for that particular subject.

Many photographers shade their lights down closely and give long exposures; but the preponderance of opinion among artists of recognized ability is in favor of using all the light the model will bear, and make shorter exposures comparatively, thus obtaining bolder modeling, finer gradations, and more brilliant effects, while not losing the softness that is characteristic of all really first-class work.

I have stated that time of exposure has much to do with the quality of the negative; it is also very true that the character of the dry plate has an important bearing on the resulting negative. I have always found that thinly-coated plates invariably had a tendency to make negatives whose printing quality tended to contrast because of the fact that the shadows were always thinner than they looked. Such plates require longer exposure, and the subjects should be more evenly lighted, than when plates of a thicker coating, although of even sensitiveness, are used.

The effect of the lighting of the subject will not be the same on the sensitive plate as it is on the retina of the operator's eye; therefore the photographer by closely observing the action of the lens will learn to see photographically, or to understand the pre-

cise effect on the sensitive plate of any method of illumination he may employ for his subject.

Also, he must understand that the time of exposure will greatly modify the effect he may be desirous of obtaining.

The subject should be posed well out under the light, and generally at a proper distance from the background, to get what is called atmospheric effect. Then, if the whole figure or head is well lighted, a proper exposure will give the effect of daylight illumination, while a short exposure will produce the effect of artificial lighting.

By daylight illumination I mean that the figure or head will be fully lighted with soft modelings and easy gradations from high light to transparent shadows, while by artificial illumination the lights are chalky or flatted and the gradations are abrupt to heavy shadows. I therefore consider that it is safer to err on the side of over exposure than to under expose, although I have known eminent photographers to lean constantly to the short exposure for picturesque effects.

Picturesque effect of pose and light should be aimed for in all photographic portraiture, and a thorough knowledge of the peculiarities of light and lens should be acquired by the artist so that his judgment may ever readily arrive at the proper methods of arrangement of the light, and the exposure for lens to produce the effects desired for any face or figure with as little delay and hesitation as possible.

This promptness of decision will secure the confidence of the sitter, and facilitate matters in a large measure, the natural result being more patrons, enlarged business, and increased profits. That such may be the good fortune of all who have listened to my views on the subject under discussion is the sincere wish of your friend and fellow-laborer.

Beautiful illustrations accompany the opening article of the August number of *The Chautauquan*, which is entitled "Up Gibraltar —To Tangier—Into Spain." It is contributed by Lilly Ryder Gracey.

ACTION OF METALS, SALTS, ACIDS, AND OXIDIZING AGENTS ON INDIA-RUBBER.

W. THOMSON AND F. LEWIS.*

THE method adopted was to take a fine sheet of India-rubber spread on paper and vulcanized by the cold process with a mixture of chloride of sulphur and carbon bisulphide, and to examine the action on this of the various substances; on breaking the paper the fine sheet of caoutchouc was left free, so that its stretching properties could be examined.

Action of Metals.—The various metals whose action was studied were used in the form of filings sprinkled on rubber. The whole was then kept at a temperature of 60° C. for ten days. Copper was found to have by far the most injurious action. Platinum, palladium, aluminum, and lead, have a very slight action, but magnesium, zinc, cadmium, cobalt, nickel, iron, chromium, tin, arsenic, antimony, bismuth, silver and gold have none.

Action of Metallic Salts and Oxides.—Saturated solutions were made in water and painted on small pieces of the rubber, or in the case of insoluable substances pastes were made with water and painted on, the whole being then allowed to dry. The heating was subsequently carried out as before. The following compounds of copper entirely destroyed the rubber: Sulphate, chloride, nitrate, ferro-cyanide, oxide, sulphide, also arsenic iodide, silver nitrate, strontium chlorate, vanadium chloride, manganese oxides, bismuth chloride. The following had an injurious effect: Ferrous nitrate, sodium nitrate, uranium nitrate, ammonium vanadate. The following had very little action: Lead chromate, ferrous sulphate, zinc acetate, zinc chloride, tin perchloride; while the behavior of about sixty salts having no action whatever was examined.

Exceedingly small quantities of copper salts are injurious to rubber, and it was found that wherever the cloth used in making proofed-cloths contained even traces of copper, the rubber became gradually hardened and destroyed. With reference to

*Proc Manchester Lit. and Phil. Soc.

the use of the various blacks the authors point out that manganese oxides should not be present, but they assert that logwood chrome blacks may be used with impunity.

Action of Acids.—Very dilute solutions of hydrochloric, sulphuric, chromic, citric, or tartaric acid are stated not to be prejudical, but nitric acid rapidly attacks rubber. A solution of sulphuric acid containing about 10 per cent. of H_2SO_4 destroys the properties of the rubber.

Action of Hydrogen Peroxide.—Since ozone rapidly attacks India-rubber, and in view of the fact that chromic acid has only slight action, samples of rubber were placed in both acid and alkaline solutions of hydrogen peroxide for a month. Such treatment has no appreciable injurious action.

STRENGTHENING LARGE SURFACES ON NEGATIVES.

WE NOW describe a method of strengthening large areas on negatives by means of absorption. It is well known how difficult, almost impossible, it is to strengthen large areas with pencil on negatives, when it is necessary not to suppress, but only to weaken certain parts. On small surfaces the thing is already full of difficulties; but it is another thing altogether when it is a question of surfaces of a certain size. We believe we have found a sure and easy means of practising this mode of correction, or modification of negatives; it consists of using dyes, introduced into the gelatine by absorption. This is how to proceed: Every part of the negative must be covered with bitumen varnish except those parts that are to be strengthened. They must be left free. The varnish is made of bitumen dissolved in benzine, and is of a thick consistency. All that part of the negative which it is intended to preserve in its original state is covered with this varnish, which is then allowed to dry perfectly. If there is any need of hurry, the drying may be assisted by placing in a warm place. The varnish should be laid on in a thick coat, and it is

better to master the process by making several trials on waste negatives. As soon as the varnish is dry, the entire plate must be immersed in an aqueous solution of yellow aniline, red magenta, green aniline, or chrisoidine, of a previously tried tint, and of a depth sufficient to bring about the desired result. This process may be gone through several times if the first immersion has not given a sufficient degree of opaqueness. The plate must be rapidly washed in water after its bath, and the bitumen varnish must be dissolved away by benzine, and there will remain the negative, but with its transparency strengthened in certain parts. This method may be applied to the coloring of lantern slides, by incorporating divers colors successively. For negatives or other proofs on collodion, the same process is applicable, on condition that the collidion is covered with a layer of gelatine, similar in thickness to that which covers gelatine-bromide plates. Thanks to this method, one obtains strengthened surfaces of a perfect purity, and much superior to those made by poured colored collodion on to backs of the plates. The edges of the surfaces obtained by this latter process have very disagreeable aureoles, but nothing of the sort is to be feared with the process of local coloring by absorption. When only very small portions of the negatives are to be treated, they may be surrounded by bitumen varnish, leaving a centre of one centimetre, then with a large brush the dye may be placed on the circumscribed surface. As soon as the desired effect is produced, the coloring matter must be taken off, the plate washed in water, and allowed to dry. It is is also possible, and sometimes advisable, to make combinations of different dyes in order to attain such tints as are not to be got by single dyes.—*The Photo. News.*

Second-Hand Sponges.—Never buy a white sponge. The beautifully clear, small sponges that are hawked about for small sums are second-hand sponges, that have probably been used in hospitals and such places, have been thrown away, picked up by rag-pickers and bleached, to be again put on the market. A man may take almost any disease from using a bleached sponge, and their use at any time is very dangerous.

THE ACTION OF BROMIDE WITH VARIOUS DEVELOPERS.

DR. EDER has lately been studying the action of bromide of potassium with various developers, and the results of his investigations are decidedly interesting. Bromide, the most commonly employed of the restrainers, he finds varies in the nature of its effects, according to the developer with which it is used. Some developers, he points out, are particularly sensitive to the influence of bromide of potassium; iron-oxalate, for instance, the bromide used as 1.10, and a few drops of that strength being added to every 100 c.c. of solution, having an energetic restraining action on normally-exposed plates. For over-exposed plates it is only necessary to slightly exceed the proportion of restrainer mentioned.

Pyro-soda behaves in a similar manner to iron, the bromide acting as a simple retarder. If, however, pyro-ammonia be used, the bromide acts as a preventative of fog, to the detriment of its powers as a restrainer of development, and it is necessary, therefore, to increase its proportions. For normally-exposed plates Dr. Eder finds for each 100 c.c. of pyro-ammonia solution thirty drops of bromide solution, 1.10, desirable, while for over-exposure it should be added in doses from 5 to 10 c.c. for each 100 c.c. of developing solution.

Hydroquinone-soda (sold in the ready-made form) is less sensitive to the retarding action of bromide than pyro. Development may be restrained therewith by using comparatively large quantities, it is true, but the developer, even with prolonged use, does not yield such good negatives as pyro or iron. Hydroquinone itself, says Dr. Eder, acts as a species of restrainer, for it not only develops slowly, but gives vigorous results, not on account of the bromide that may be used with it, but in consequence of its own decomposition by oxidation, the oxidation retarding the growth of the image, without tending to impair the vigor of the resulting negative.

With eikonogen and metol, notably the latter, bromide acts in the double capacity of preventing fog and restraining develop-

ment, but the retarding effect is less noticeable than with the developers previously named. Very fully exposed plates can be held back by the use of bromide, but over-exposed pictures, says Dr. Eder, when developed with metol or amidol, are not so well controlled, even with large quantities of bromide, which is unable to check the energy of metol,—one that has been used several times,—retards development, but does not yield vigorous negatives.

Dr. Eder concludes his interesting note by saying that to metol-soda or metol-potash a slight addition of bromide (1.1000) has such little restraining power that the manufacturers themselves often add bromide to the ready-made solutions, without the user noticing any retarding effect of these developers. The only effect produced is that negatives so developed have no fog.

SELF-RECORDING COMPASS.

THE Townsend Marine Invention Company, of Baltimore, Md., are promoting a simple form of photo-recording compass, in which sensitive film is caused to travel through a dark box in a direction at right angles to a narrow slit in the top of the box. This slit lies in a radius of the compass card; and extending once round the card itself, from the centre to near the circumference is a narrow spiral slot, which crosses and admits a portion of light through the fixed radial slit in the photographic box or camera before mentioned. A lamp is arranged to project light through the transverse slits on to the surface of the sensitive film or paper, the result being that with each different position of the compass card, the spot of light which is transmitted reaches a corresponding point in the breadth of the sensitized band. Owing to the continual oscillation of the compass needle, it appears to us that there is no reason why this spiral slot should be quite continuous. It might even be replaced by a close series of small holes, so that no structural difficulties would arise from

this feature in the card. Photographic or mechanical means, of a sufficiently obvious character, are proposed for registering intervals of time upon the moving film. And it is also suggested to record the speed of the ship at the same time by photographic means. With this in view a small annular slit might be employed, so as to impress the film at intervals with a little black ring and prevent confusion; but a mechanical method of printing or perforating the paper would be preferable. The width of the principal slit is put by the inventor at 3-1000ths of an inch, which is obviously too narrow. If we put it at 100th of an inch, and suppose that the vibrational period of the needle is half a minute, we should require the sensitive paper to move at the rate of, say, 1-50th of an inch per minute in order to obtain a satisfactory impression, and a band of 16 feet 10 inches in length would be requisite for a week's work. The designer of the registering compass proposes to use ordinary silver paper, which would, of course, be out of the question. Otherwise there is nothing impractical in the scheme, and in the course of time it may possibly commend itself to ship-owners.

The authority of the *New York World*, in its assertion that spectacles were well-known to the ancients, having been questioned, that journal observes: Layard found them in the ruins of Nineveh. Rawlinson records the finding of lenses used in lapidary work, which it was long known could not have been done without powerful magnifying-glasses, in Mesopotamia. Aristophanes is the authority for the statement that they were known to and used by the ancient Greeks. They are put upon the eyes of engravers in the Egyptian drawings made long before Aristophanes, who lived in comparatively modern times, about 2300 years ago, when Rome was a straggling village, and the Hebrews were rejoicing over the rebuilding of the Temple. If the Babylonians had not been fully acquainted with lenses, how could they have discovered, 1000 years before the Christ, that Jupiter had four moons and Saturn seven?

In 1861 photography was first successfully applied to the transfer of art works to wooden blocks.

AUTOMATIC SUBMARINE PHOTOGRAPHY.

J. FOCUS SNAPPSCHOTTE.

AND now, according to *Figaro*, comes the information that the problem of submarine photography has been solved,—with results far exceeding the expectations of the most sanguine of even French experimentalists. The fortunate savant who has thus immortalized himself is one Louis Bouton, a "privat-docent" of the Paris University,—who, after numerous experiments and failures, finally succeeded by the use of an ingenious apparatus of his own invention. The young savant first donned a submarine diver's suit and descended to the bottom of the sea, in the vicinity of the Government ichthyological laboratory at *Banyule-sur-Mer*, where he attempted to make several exposures by the natural light, using a specially constructed apparatus, for submarine work. He however soon found that the light was too weak or the present emulsions not sensitive enough for work fathoms beneath the sea, and that the time required was entirely too long. It was further found that the least movement of the surface of the water caused dark shadows or clouds in the depths beneath.

M. Bouton at once recognized that for practical purposes instantaneous exposures only were applicable. For this purpose he constructed a new apparatus, which would furnish the requisite illumination. This invention consists of a glass globe hermetically sealed in which is contained a flask of oxygen, which feeds a spirit lamp. At the proper time, by an extremely ingenious contrivance, a steady stream of aluminium powder is blown into the flame by the mere pressure of a rubber bulb; the result being an exceedingly brilliant illumination. With the exception of the rubber bulb, the whole mechanism, which is both novel and simple, is of course all enclosed within the watertight glass globe.

The learned savant of the Paris University declares that when he uses the apparatus, after he has descended to the bottom of the sea, he first fires a few flashes to attract the fish. Immediately

the denizens of the deep, of all sorts, kinds and conditions, flock to see the strange intruder into their submarine realm.

Giving his experience he describes how great fish swim around him, smaller varieties come in shoals, while porpoises and dolphins rub their noses against him like pet spaniels to their master. Strange ichthyological monsters, attracted by the bright light, came near enough to be stroked with the hand, and showed no more objections to his caresses than a pet cat does to her mistress.

To obtain the best groups, M. Bouton sets up his submarine camera on a specially designed tripod: he then arranges the ichthyological specimens in an artistic group about three meters in front of the camera, attracting their attention all the while by an occasional flash from his lamp. When all is ready he steps back, squeezes the bulb, and a blinding flash and a perfect submarine photograph is the result.

Thus far the greater number of experiments have been confined to a protected bay some distance from the shore. A plan for more extended experiments is now being perfected. M. Bouton has also succeeded in perfecting an automatic submarine photographic apparatus, dispensing with any tripod, from which great results are expected. This contrivance it is thought will work in the almost unfathomable depths of the Pacific, where it is believed that the Ichthyosaurus and Plesiosaurus and other antediluvian monsters still roam unmolested and undisturbed.

For Bouton's Automatic Submarine Photographic Apparatus no depth is too great, as it is merely lowered from the vessel by a stout piano wire—the electric current setting the whole contrivance in motion when the requisite depth is reached. It is expected that by these means the secrets of the ocean's depths will be brought to the view of the scientific world.

From private advices it is learned that the first series of extended experiments with this automatic submarine apparatus were made on the site of "Atlantis," the lost continent in the Atlantic Ocean. What wonderful revelations are recorded in M. Bouton's sensitive plates exposed at the bottom of the Atlantic

is a secret which is being carefully guarded, and when published will no doubt astound the world.

The delay in the publication of the results attained has been caused thus far by the extreme conservatism of M. Bouton, who at the same time wants to reap the fullest reward for his great invention. He therefore refuses to publish any results until M. Lippman perfects his color process, so that his submarine photographs may be reproduced by the intaglio process in the colors of nature by the ordinary printing press.

TALKEE, TALKEE, NO WORKEE.

WALTER D. WELFORD.

"COSMOS," of the *British Journal*, asserts that we are in danger of too much "talkee, talkee." To some extent I feel constrained to agree with him, though in a slightly different direction to that implied in his caustic paragraph. It is not altogether to the papers at conventions, conferences, and congresses I would refer to, but to schemes so elaborate in their nature, or so sentimental in their conception, that they are foredoomed to failure. They are so much "talkee, talkee," and that is all.

True, they serve to air certain men's proclivities for fame,—such as it is,—and raise them to the dignity of a top-hat. Their scheme is written about, criticised, and generally they receive a considerable amount of credit, besides the pleasure of seeing their names in the photographic press. The scheme may even be started, and officers elected. All "talkee, talkee." Nothing further results.

Upon the sentimental side must be placed the pretty little resolutions passed at the convention and congress in America. This fraternity, this feeling of unity, this desire to learn and teach each other, is merely "talkee, talkee." It is not a bad thing for a convention or a congress, and it will hardly do much

harm. It affords the opportunity for the budding orator, it gives play to fine stretches of imagination, and the tongue turns over the choice morsels of word-linking with gusto. It sends a thrill of patriotism and photographic enthusiasm through the body, we applaud, and perchance endeavor to go one better ourselves, in high-flown language, as soon as the speaker finishes his oration.

It is nice to read how ardently the whole of Great Britain and Ireland, India, and all our colonies, are yearning for a complete photographic unification. It sounds well; and, moreover, how every English photographer is dying to fraternize with the Americans. The papers are full of it at the present time.

Still, but little harm will result; it will die down in a short while. Such resolutions and such speeches are merely bunkum, and the American is too wide awake to treat them as anything else.

My American friends will perhaps consider these remarks as showing bias against them and their nation. If they do they must, that is all. But I have no intention of so doing. Editorial friends over the water know full well, by the magazine itself, and from the frequency with which the men and matters of America are therein dealt with, that I am no bigot of this sort. The criticism is levelled at sentimental "talkee, talkee, no workee."

Let us look at union affairs in England. The Photographers' Benevolent Association has never been in a flourishing condition, in spite of the efforts of its hard-working officials. It is not supported in any reasonable way by photographers. The union of assistants was going to revolutionize the world—to effect wonders. It didn't, but fizzled out instead. The National Association of Professional Photographers seems doomed to perpetual impotency. Even the Convention is but a sorry show, considering the number of photographers in the kingdom.

Nevertheless, we must do a lot of big "talkee, talkee," with friends over the water. Would it not be better to "workee, workee," a little in our own country?

And how much do the rank and file of English amateurs and professionals alike concern themselves with the matter at all. To them it may be interesting "talkee, talkee," but there it stops.

Then take these elaborate international schemes, what earthly chance have they? Even our own exchanges, of print agencies and surveys are always in a more or less languishing condition. A glance at the committee appointed will settle the question. They reside, severally, in England, America, India, France, and Japan. This must be termed a very handy body—for work.

Why cannot we have more robust manliness in our photographic world, why all these inane little sentimentalities? The British Convention was bad enough, but the Congress at Chicago appears to have reeked with compliment, and "talkee, talkee." Not that it is at all new, but as the old Scotch proverb puts it:

"An auld tout on a new horn is little minded."

—*Photographic Review of Reviews.*

Astronomers' Measures.—At a recent meeting of the Boston Scientific Society, Dr. S. C. Chandler, in speaking of astronomical instruments, referred to the extreme delicacy of astronomical measures. The bending of the tube of the telescope, no matter how well it may have been constructed, is an element of error, easily detected. Its shape when horizontal, when inclined at different angles, when pointed vertically upwards, differs in the different positions, and, when vertical, the weight of the lens and of the tube itself exerts an unequal compression on the different sides of the tube, to an extent measurable to the astronomer, as the shifting of the lens in its cell, even as little as the thirty-thousandth of an inch, can be perceived by the observer, while the heat of his body affects to a measurable extent the metal work and scales. All these sources of errors the competent astronomer must search out and eliminate from his observations.

Light and Disease.—Dr. Thomas Geisler has recently made some interesting observations of the effect of light upon bacilli. His experiments were conducted with both sunlight and electric light, and, while he has established the general effect of both kinds to be the same, he has been unable to compare them. He found the germ of typhoid fever to be greatly affected and retarded in growth by light, and he determined in addition the relative effects of lights of different colors. The advisability of having sunlight about and within our houses has thus received confirmation from a new standpoint, while the use of the electric light in the sick-room may prove to be a valuable sanitary adjunct.

The Editorial Dropshutter.

Defective Photographic Apparatus.—Too much care cannot be exercised by the makers of photographic apparatus. That there is entirely too much cheap work put upon the market at a high price will be acknowledged by most every photographer, professional as well as amateur, especially the latter. An instance of this kind was brought prominently to our notice lately by a leading photographic worker in this city, who started out to purchase a new dark room lamp of a noted New York make. The lamp was purchased at a high price, and when taken home it was found that the bowl was not oil-tight; it just took five minutes for the oil to spread itself over the developing sink. The defective lamp was returned, and as it was the only one the dealer had; another establishment was tried, with like result. An order was then sent direct to the makers,—the one received was even more leaky than the previous ones tried. The manufacturers of this special lamp are a reputable firm, they demand a high price for their productions, and their goods should be perfect.

The above is only another instance of the many annoyances the photographic worker is subjected to.

Balloon Photography.—In a late issue (August 31st) of the *London Optician*, in commenting upon our paragraph on "Balloon Photography," wherein we stated that "Mr. Jenning's negatives were the first perfect photographs, so far as we have knowledge, ever taken from a free balloon," the editor adds: "It is to be regretted that knowledge of European progress is such a limited quantity in the Atlantic States." Now, all we have to say is that if the *Optician* knows of any European efforts of a similar character made from a *free* balloon, why let him bring it out before the photographic world, and the AMERICAN JOURNAL OF PHOTOGRAPHY will be the first to make the *amende honorable*. Of course, talk is cheap; so is printer's ink. However, the proof is what is wanted. That there have been many attempts made to utilize photography from both captive as well as free balloons, are facts well known to us, even with our limited quantity of knowledge. But where we have seen passable results from a captive balloon, we have never seen any worthy of the name taken from a free air-ship, until the series mentioned in the AMERICAN JOURNAL OF PHOTOGRAPHY, one of which we reproduced, and it was not the best one either. Now, let the *Optician* make good his statement, or else, like Davy Crockett's coon, come down gracefully. In the meantime, we adhere to our original claim.

Credit To Whom It Is Due.—In our August JOURNAL we republished an excellent paper by Mr. Robert Faunce upon "Transparency-Making for the Lantern." This should have been credited to the *Optical Magic Lantern Journal* of London. The credit was certainly on the final proof when passed by the editor, and why the void should exist in the current number is more than we can explain.

"The Shaskin Sowa," our Japanese contemporary, commencing with the May number, does us the honor to reproduce in Japanese our illustrated paper on "Elementary Optics," published in the AMERICAN JOURNAL OF PHOTOGRAPHY during the current year. Our Oriental contemporary evidently knows a good thing when he sees it.

Mr. James A. Bradley, the founder of Asbury Park, in consequence of a case bordering on black-mail, brought about by the aid of a hand-camera, has issued an order preventing the use of the instruments on the Bradley Beach Promenade or in Asbury Park without a special permit, which he will give to any one who agrees not to abuse the privilege.

American Rapid Dry-Plates.—So great has become the demand for American dry-plates throughout Europe, on account of their uniform superiority, that plates are now made upon an extensive scale in Germany, and sold under above title. This is but another proof of the superiority of American ingenuity. It is claimed that the American plates are far more certain and reliable than the foreign product.

A Novel Advertisement.—One of the large dry goods shops in Philadelphia now advertizes for visitors to bring hand cameras and photograph anything in the establishment that strikes their fancy.

A New Panoramic Camera has been constructed by a Philadelphian, who is well-known in photographic circles. From specimens shown, it is thought that the new camera has many advantages over its French prototype. As soon as a patent is obtained the novel apparatus will be placed on the market.

Photographic Congress.—It has been finally arranged that a Photographic Congress, under the auspices of the Photographic Society, shall be held in London on the 10th, 11th, and 12th of October. A full program will be circulated as soon as possible.

Photographic Scissors and Paste.

Manuscript Lantern Slides.—Many lecturers have found some difficulty in making a sketch or writing an announcement upon a piece of plain glass, without the aid of photography. Several methods have been tried, such as using smoked glass and etching on it with a needle or pen, but this is a disagreeably dirty process, to say nothing of the numberless fractures of glass which occur whilst it is being smoked. Another method is to write on ground glass with a hard pencil, and then to make it transparent by filling the pores with Canada balsam. This again has several drawbacks, one being the difficulty of making any corrections without washing out the whole. By far the best way to make an impromptu slide is to write upon the glass with chinese white, which can be procured in a moist state at any color shop, using an ordinary pen for the purpose. This chinese white will require thinning down a little; this can be done with beer. If, however, the lecture is a temperance one, ginger beer of the home-made variety will do nearly as well, or, failing that, sugar and water or water alone can be used. Music, sketches, diagrams, etc., can be readily produced in this way. They are quite permanent, and would appear to the uninitiated to be collodion slides of superior quality—try it.—*Hand Camera and Lantern Review.*

Aerial Photography.—The popular feature of the last regular meeting at the Franklin Institute was an exhibition of the results of some recent experiments in balloon photography by Mr. William N. Jennings, of this city.

Mr. Jennings was one of the party who accompanied Prof. King in the ascension made in the "Eagle Eyrie" from the Park, on July 4th last. The day was fortunately very clear, and, although this was the first work in this sort of photography which Mr. Jennings had done, the results achieved were far better than most views which have been taken in this way.

The views, 25 or 30 in number, were shown upon the screen by means of the optical lantern, and Mr. Jennings explained them in his characteristic bright manner. Instead of following the method of some of the French experimenters, who made their negatives with the plates parallel with the earth's surface, with the result of producing a strained and unnatural effect, Mr. Jennings made the "eye of his camera" see the views as he saw them. In consequence of this the

various views were perfectly natural, and the objects thousands of feet below are seen in their natural positions. The definition in the various views was wonderfully clear. A small portion from the centre of one of the negatives was enlarged, and the details were as clearly brought out as could be desired. Mr. Jennings pointed out that this experiment showed that with the use of one of the modern tele-photographic objectives it would be possible to make clear balloon negatives of objects 25 or 30 miles distant, and that the practical value of such a power in military operations was obvious.

Among the views shown were several overlooking the Schuylkill river, the Park and adjacent portions of the city; one looking east and taking in a wide arc from about Thirtieth street and Girard avenue on the west to Petty's Island on the east; several over the Delaware and a number in New Jersey. Many of the latter were taken at 6.30 and 7 P.M., and were, notwithstanding the lateness of the hour, remarkably clear and distinct.—*Phila. Ledger.*

The Victoria Disaster.—To the outsider, one of the most interesting pieces of evidence tendered at the court-martial on the loss of the *Victoria*, was the production of the instantaneous photograph of the sinking ship, taken by an officer on board another ship in the fleet. A print of this has also appeared in the windows of the office of a contemporary in the Strand, and has excited as much attention there as it did in court. The ill-fated vessel is shown with her stern in the air and screws revolving, while from the disturbance of the water it seems as if the plate had been exposed just at the moment when the explosion took place. It is more than interesting to have this clear, unimpeached record of the scene, especially in view of the confusion that renders the accounts of eye-witnesses so varied. But conceive the coolness of the officer who took it!—*The Amateur Photographer.*

Nature's Photography.—A stone found in a forest that shows a marvelous piece of work.—Hugh Graham, an English tourist traveling in America, lately took to lapidist James W. Beath, of South Tenth Street, a piece of rock containing a perfect photograph of a species of fern now known to be extinct. The specimen was picked up by Mr. Graham in a forest near Florisant, El Paso Co., California. One side of the stone, which is flat and smooth as if planed, contains what looks to the naked eye precisely like a photagraph of a fern leaf pasted on it, but, when examined under the microscope, it is seen to have been the work of nature. In some past age, while the piece of stone which Mr. Beath calls forest rock was in the plastic state, a fern leaf was in

some way pressed into it. To the eye the delicate tracery of the veins forming the leaf seem to stand out in full relief, but when seen under a magnifying glass every vein of the leaf is seen to be delicately chiseled into the hard surface of the rock.

Less than fifty years ago there was really no postal system in this country. Previous to 1847 the mails were carried by private firms, and rates varied according to distance. Carriers often traveled on foot or horseback, and the progress was slow. In 1846 some of the post-offices issued stamps of their own, called "provisional issues." The adhesive stamp was first used in this country in 1847, and prepayment was made compulsory in 1856. In 1863 the stamp containing the head of Andrew Jackson was issued, and from then until 1885 the style adopted contained the profiles of Presidents of the United States. —*Public Opinion.*

The Unattainable.—"I know I'm not alone," said a well-known amateur photographer, "in having a perfect passion for the accomplishment of the unattainable.

"Don't call it a hobby, because I regard the feeling with something after craft sacredness. Now my present passion comes on with almost overwhelming force as I walk along Chestnut Street and gaze into the faces of the changing cosmopolitan crowd, and the desire that possesses me is to reproduce the scene in panoramic fashion as it impresses itself upon my mind.

"You men who use the pen can attempt a description, but no words can speak as a photograph can, and I can't give an idea of the longing I have to picture that scene and furnish it to friends outside of the city.

"Don't I have the same fever for reproducing other scenes? Yes, but they don't quite approach this in point of fervor.

"I have friends who have this photographic fever, more than one craving to be able to use color photography.

"But the most flattening sensation I know of, and one that is common to the amateur photographer, is to see something really beautiful and not have a camera within reach."

Variable Stars and Photography.—In a late issue of Dr. Gould's "Astronomical Journal" Mr. Edwin F. Sawyer call attention to the unreliability of photography as a means of determining the variation in the light of the stars. Being one of the leading star observers of the world, he speaks from experience, and states that those who have occupied themselves with the observation of stars whose

variations have been announced as discovered by photographic means, have hitherto met with a singular lack of success in confirming a large proportion of them, and in his opinion, for the present at least, observers must hesitate to accept evidence from photographic plates, especially when the fluctuation in light is not considerable, at least more than a magnitude.

The Largest Photograph.—It is seven feet long and fifty inches high, and is a photograph of a relief map of the United States showing the oil-bearing districts. Photographers stand before the colored transparency in the north gallery of the Mines Building and declare it to be the biggest thing in the Exposition, and so it is, from their standpoint. J. K. Hillers, of the United States Geological Survey, is the man who made the wonderful photograph.

The model relief map was started three years ago. It is made of wood veneers, one thirty-second of an inch thick, each thickness representing 100 feet of elevation. The map was built up of these veneers, and then carved in relief and a plaster cast taken. With the light striking it from the northwest it was photographed, the lights and shadows giving it a beautiful tone. When the negative was transferred to paper, the States, lakes, and names were drawn in, and a negative was taken from it 20 inches square. This negative was enlarged to the size of the transparency, 84 inches by 50 inches.

No ordinary camera could do the work, so the photographer made a camera of a room, 12 by 15 feet in size. The room was blackened inside, and made light and even air-tight. The shutter was placed in the window and the lens in the shutter. Mr. Hillers had three expert photographers assisting him.

The work was focused on a ground-glass plate the same size as the photograph. This was done by three men holding the plate, and moving it back and forth until the proper focus was secured. Then the sensitive plate was made ready. This was a piece of American plate-glass, three-eighths of an inch thick, made and polished for this particular picture. The photographers had to wait two months for proper conditions of light and temperature. A work of this nature had never before been attempted on such a large scale. Mr. Hillers was obliged to feel his way, for he did not know just how long the plate should be exposed. A test was first made with a small plate, and this gave him an approximate measure of time.

With rare good fortune the first exposure of the new plate was a success, and a beautiful photograph was secured. Then a specially-arranged hose was turned against the big plate to wash away the

chemicals. It took an hour to do this. After the toning process came the matter of varnish. This was the critical phase of the operation. The plate was laid on four rubber balls, one at each corner, and Photographer Hillers tilted it while an assistant poured on half a gallon of varnish. Success still remained with him, and the transparency was ready for its colors. It took four months from the beginning, when the first negative of the map was taken, to finish the transparency. It is valued at $5,000.

A Boy Kleptomaniac.—Ernest Pixton, 15 years old, was arrested at Lancaster, Penna., on a charge of stealing from A. M. Lease, his employer. He was working at the photographic gallery of Mr. Lease for the past three weeks, but in that time he stole over $50. Mr. Lease missed money daily, but was unable to detect the thief. Mrs. Lease was worried by the daily disappearance of money, and she concluded to watch for the thief. Late on Saturday afternoon she secreted herself and in a short time saw young Pixton go to the money drawer, open it and take out several notes and some silver. She saw him put it in his pocket, and then slipped into the room where he was and accused him of the theft. He denied it. Chief Borger was sent for, and on his arrival he searched the boy. He found on him a $5 marked note taken from the money drawer and $5 in silver. The boy was taken to the station-house and locked up. He admitted having stolen money every day that he was in the employ of Mr. Lease, but said he could not help it, as whenever he was near money he was seized with a desire to steal, and could not help himself. He told the chief he would find secreted under the carpet in his room, $38 that he had stolen from Mr. Lease. The chief went to the boy's home, and found the money just where he said he placed it.

Mr. Lease went before Alderman Norbeck, and entered suit against young Pixton. His father was notified of the arrest, and he entered bail for the boy's appearance at the hearing.

The case will probably never be tried in court. The father of the boy intends sending him away from town until he is cured of kleptomania, with which he appears to be afflicted.

The employment of photographs in the formation of sculptures was first made by Villeme in 1863.

Theodorus the Greek is reputed to have been the first sculptor to cast metals in the form of statuary.

Correggio, in the sixteenth century, brought the art of chiaroscuro and relief to comparative perfection.

Photographic Hints and Formulæ.

Photographing Upon Boxwood.—Of the known processes for the production of photographic images, etc., upon boxwood, according to the *British Journal Almanac*, the majority are not very practical, especially those where the layer is produced on the wood, or when the wood comes in contact with the fluids. The former makes it very difficult to obtain a clean and easy cut, while the latter causes the swelling of the wood, and the consequent roughening of the surface. These evils are prevented by the following method:

Four grammes of nitrate of silver are dissolved in 500 cc.m. of water, and to this is added a solution of one gramme cooking salt and one-fifth gramme dextrine or gum arabic in 250 grammes of water. The entire mixture is well stirred, and the whole quantity of clear fluid standing over the resultant silver chloride percipitation is poured off as much as possible. There is then added a solution of two grammes of nitrate of silver, dissolved in as little water as it will take to dissolve the same. The whole composition is then spread in a warm place to dry the silver chloride. The dried silver chloride is then rubbed directly upon the wood-block, when the latter can be immediately exposed under the negative.

The lowering of the sensitiveness is accomplished as follows:

A sheet of blotting-paper a little larger than the wood-block is laid on a glass plate, and is dampened with a strong solution of muriatic acid. The wood-block is brought with its surface over this paper, and is kept at a little distance from the latter by three small pieces of wood which have been placed between. . The acid vapors arising from the paper change the free nitrate of silver into silver chloride, and render the latter sufficiently non-actinic for most purposes.

A higher degree of this want of sensitiveness is reached if the wood-block is treated after this, and in a similar manner, with ammonia, and then again with muriatic acid.

These methods of obtaining the design to be engraved upon the wood-block have been greatly multiplied by the individual efforts of wood engravers generally, each having some special process for which he is ready to claim superior merit and efficiency.

Interference Bands.—Among the exhibits at the Conversazione was one which possesses a special interest to photographers. Since the advent, in a practical form, of pin-hole photography, much has

been said about interference bands, and their effect upon the image. Indeed, the theoretical minimum bands, and their effect upon the capable of giving the best definition without interference bands destroying it, has been worked out by Lord Raleigh; but what these bands are is not very well understood. In the example we refer to, light was allowed to fall on a mirror thinly silvered, so that about half of the light is reflected and half transmitted. The two rays pursue paths which are normally perpendicular, are reflected back by two ordinary mirrors, and, on meeting, interfere. The interesting part of this arrangement is that by its means the bands can be reflected on a screen, and this fact, together with the simplicity of the arrangements, will make the method a very useful lecture-illustration.

A Permanent Acid Fixing Bath.—The following is recommended by the *Bulletin* of the Photographique Club de Paris:

Water	350 c.c.
Bisulphite of soda	10 grammes.
Hyposulphite	40 grammes.
Chrome alum	2 grammes.
Citric acid	15 grammes.

The bath is said to keep indefinitely, fix rapidly, and obviate staining of the plates.

Typewriter Ink.—The following formula for an ink for use on typewriters is taken from a previous issue of a druggists' circular:

Aniline black	½ oz.
Alcohol	15 oz.
Glycerine	15 oz.

Dissolve the aniline in the alcohol, and add the glycerine. Any other aniline color might be used in the same way.

For inking typewriter-ribbons the following process has also been recommended: Into two ounces of any aniline writing fluid put a teaspoonful of thick gum arabic mucilage and a teaspoonful of brown sugar; warm the mixture, and immerse the ribbon from the typewriter long enough for it to become well saturated. When dry, spread the ribbon on a board, and brush it well with glycerine. Should there be too much color in the ribbon, press it out between papers with a warm flat-iron; or, if too dry, brush it again with glycerine. The secret of the ribbon giving out its color is in the glycerine, and if there is body enough in the color there is no danger that it cannot be made to work well. A ribbon so prepared is not affected by the dryness or humidity of the atmosphere.

It is necessary that the ribbon should retain a certain degree of moisture, for the gum and sugar make it dry and harsh, so the glycerine-coating is put on, but there is danger of smearing the paper with too much moisture, or a wrinkled surface, and the ironing obviates this.

Copying-Ink.—Any ordinary ink may be converted into a copying-ink by the addition of sugar or glycerine, or both. The following recipes given in the above-named chemical review, will serve as types:

I.	Parts.
Galls	120
Iron sulphate	30
Water	1000
Gum arabic	20
Glucose	10
Carbolic acid	1

II.	
Galls	100
Iron sulphate	33
Vinegar	250
Logwood	66
Gum arabic	25
Sugar	35
Glycerine	2
Water	750

Solution of indigo is frequently added to inks of the above class for the double purpose of giving a more decided color, and increased resistance to tampering with chemicals.

A Combined Toning and Fixing Bath Without Sulphocyanide.—Herr Valenta recommends the following:

Distilled water	1000 parts.
Lead nitrate	10 parts.
Soda hyposulphite	200 parts.

For use add fifty parts of a one per cent. solution of gold chloride. The bath is said to answer with most commercial chloride papers. It does not work at its best at the first, and it is therefore recommended to tone one or two prints by way of trial.

Clearing Negatives Developed in Impure Water.— M. E. Forestier, in *L'Amateur Photographe*, says that the quality of water used in making up developing solutions is not always irreproachable, which causes the lights and half-tones of a negative to have their trans-

parency degraded. In order to remove this veil, he recommends that the plate, after fixing and washing, should be immersed in a solution of

Water	1000 c. c.
Oxalate of iron	20 grammes.
Alum	80 "

This clears the negative, which should then be well washed.

Black Tones in Ferro-Prussiate Prints.—A contemporary says that ferro-prussiate prints acquire black tones by treatment with a solution of silver nitrate, followed by development with iron oxalate. The print, fixed and washed as usual, is placed in a solution of silver nitrate, in which it is left until it has bleached, when it is placed in the developing solution. If, after development, it is placed in a solution of hypo the black tone will tend to disappear, passing black to the blue stage. Thus, with a little care, a print may be obtained, in which the deep shadows are black, while the half-tones are blue.—*The British Journal of Photography.*

Microphotography with Orthochromatic Plates.—By M. Monpillard (*Bull. Soc. Franc.*, Vol. IX., 241).—M. Monpillard for scientific research prefers to orthochromatize his plates himself, the effect of the operation being, if the plate be used at once, at its maximum. He invariably uses a colored screen with orthochromatic plates, and gives formulæ for erythrosine, cyanine, and erythrosine-cyanine baths. In the last case the erythrosine solution employed does not contain ammonia consisting merely of

·1 per cent. aqueous solution of erythrosine	20 c.c.
Distilled water	80 c.c.

This is followed, after washing, by

·2 per cent. alcoholic solution of cyanine	4 c.c.
Water	100 c.c.
Alcohol	5 c.c.
Ammonia	1·5 c.c.

As a colored screen he employs a trough of glass with parallel sides two millimetres apart, containing one of the following solutions:

For light yellow screen, 1 per cent. solution of neutral potassium chromate.

For deep yellow screen, 5 per cent. solution of neutral potassium chromate.

For orange screen, 8 per cent. solution of potassium bichromate.

For red screen, ·2 per cent. solution of erythrosine.

He advises the use of the screens thus:

FOR OBJECTS IN MONOCHROME.

Color of Object.		Sensitiser.	Screen.
Actinic colors	blues or violets . . deep pale	Erythrosine	Light yellow.
			Deep yellow or orange.
Slightly actinic or non-actinic colors	greens	Erythrosine	Deep yellow or orange.
	yellows		
	yellowish orange		
	reddish orange .	Cyanine	Deep yellow or orange.
	red		
	deep red . . .		Orange, together with red.

Enlarging Films.—The *Moniteur* publishes as a novelty a process for enlarging photographic films without enlarging apparatus. The method is familiar enough in England, and depends upon the stretching of a film loosened by hydrofluoric acid. The formula for the stretching solution is given as follows:

Hydrofluoric acid	1 part.
Citric acid	4 parts.
Glycerine	1 part.
Acetic acid (glacical)	1 part.
Water	32 parts.

All by weight. The unvarnished film laid in this solution gradually detaches itself from the plate, and enlarges itself at the same time. A final rinse in water while the film is transferred to a larger plate concludes the operation.

Bromide Prints.—The following developer is said to give extra fine results with bromide paper, both velvety black and sepia: When using it the image should appear slowly, and develop up strong, clear and brilliant. When the shadows are sufficiently black, the developer should be poured off, and the print flooded with a clearing solution:

OXALATE DEVELOPER.

No. 1.

Oxalate of potash	1 lb.
Hot water	48 ozs.
Acetic acid	3 drs.

No. 2.

Proto-sulphate of iron	1 lb.
Hot water	32 ozs.
Acetic acid (or ¼ oz. citric acid)	½ dr.

No. 3.

Bromide of potassium	1 oz.
Water	1 quart.

These solutions must be kept separate, mixed only for immediate use in the following order: No. 1, 6 ozs.; No. 2, 1 oz.; No. 3, ½ dram. After exposure the print must be soaked in water until limp, when it is to be immersed in the developing solution.

The clearing bath consists of:

Acetic acid	1 dram.
Water	32 ozs.

and the fixing bath:

Hypo	3 ozs.
Water	16 ozs.

After fixing, prints must be washed for two hours and then hung up to dry.

So much interest is now taken in sepia tones that we give the formula as supplied by the makers:

Sepia Toning Bath.

Hyposulphite of soda	10 ozs.
Ground alum	1 oz.
Boiling water	70 ozs.

Dissolve the hypo in the water first, then add the alum slowly. When all is dissolved the solution should be milk-white. This solution should not be filtered. It works better as it becomes a little old. It may be strengthened from time to time with a little fresh solution. Never throw the bath away entirely, but replenish in the manner stated. The best results are obtained by keeping the bath hot, or as warm as the emulsion will stand; say 110 to 120 degrees Fahr. In this bath "Nikko" prints will tone in twenty to thirty minutes. Until this bath has been used several times it may be inclined to bleach the prints a little, but as it grows old this tendency will disappear. The prints should be fixed, then immersed in a cold toning bath, and then transferred to the hot bath. After toning, rinse in a tepid solution of

Water	70 ozs.
Alum	2 ozs.

Then wash thoroughly. The object of putting the print in a cold toning bath first is to harden the gelatine before putting in the hot bath. Plain alum solution will not answer, because transferring the prints from it will overcharge the hot bath with alum. The object of the final alum bath is to prevent blisters, and it need not be used unless they occur.

In the Twilight Hour.

MANY a strong-headed man has weak ideas.

THE cloven foot is often concealed in patent leather.

IT always makes the devil spit fire to be called a hypocrite.

THE devil has a tight grip on the man whose god is money.

THE head is never regenerated until God gets into the heart.

HOW easy it is to tell by the honey where the bees have been.

THE devil chuckles when an unconverted person joins the church.

THE best investment any man can make is to give as God expects him to.

THE right kind of a man always learns something worth knowing from a mistake.

THE devil's will is done on earth as it is in hell, when wicked men have their own way.

SOME people never find out that there is joy in giving, because they do not give enough.

THE devil gets millionaires by making them believe money can do more for them than God.

A BORE is one who insists on talking about himself all the while you are wishing to talk about yourself.

THERE are people who think their neighbor's house needs painting, because they neglect to wash their own windows.

THERE are people who claim to be praying for the salvation of the whole world, who never go to prayer meeting in rainy weather.

CHARITY gives itself rich; stinginess hoards itself poor.

FEET accustomed to God's pathway can find it in the dark.

WHEN the town clock is wrong it spoils a good many watches.

THE smallest sin is big enough to keep Christ out of the heart.

TORMENT begins when a sinner finds out that God sees him.

KEEP the Bible open and the door of heaven cannot be shut.

GIVE one sin the right of way, and it will wreck the universe.

AS SOON as sin is hated we are willing to go to war and fight it.

THE fool's guerdon is success; the wise man's usefulness.

NO honor can be conferred upon the memory of a good man by a monument.

THE more your enemy hates you the harder you can hit him with kindness and love.

THERE are spots on the sun, and yet some people expect a twelve-year-old boy to be perfect.

THE church says to the world, "Come, be converted;" the Master said to the church, "Go, disciple!"

THE poor rich are by far the most difficult class to help, but by skillful personal work they can be reached with the gospel.

THE unconverted are accessible if Christians have any good to impart; Lake Erie has no difficulty in getting into Ontario.

Literary and Business Notes.

DAS ATELIER UND LABORATORIUM DES PHOTOGRAPHEN. Von Dr. Josef Maria Eder. Second Edition. Enlarged and brought up to date. 325 illustrations in text. Published by Wilhelm Knapp, Halle a. S., Germany.

This volume is virtually a supplement to Dr. Eder's great text-book, "Handbuch der Photographie." Thesubjects dealt with are exclusively of a practical nature, every chapter being fully illustrated. Every thing in connection with the studio and laboratory is spoken of, and explained in a thorough manner. The location and furnishing of the studio is the subject for the first chapter. Many practical hints are given on lighting, and the various methods of glazing and illuminating the studio. The second chapter describes every variety of photographic studio ever built. Another chapter describes the various styles of dark-rooms in use in Europe and America. Chapters on the washing apparatus for prints and plates, dark-tents and portable vans, on the care of plates and apparatus, together with plans for an enlarging studio, complete the work. The thoroughness of Dr. Eder's work is so well known at home and abroad, that we can but add that the present volume is fully equal to any previous one from the same talented pen.

THE GRAMMAR OF PHOTO-ENGRAVING. By H. D. Farquhar. The Scovill & Adams Co., New York, 1893.

A neatly-gotten-up book of 140 pages, printed on good paper with clear type, and is fully illustrated. The "Grammar" will prove a boon to the constantly-increasing number of persons who are seeking after practical knowledge in the art of process-engraving. Although written more from the learner's standpoint, it will be found to be a valuable text-book on the photo-mechanical processes.

CONVENTION NOTES.—Especial attention is called to the advertisement of American "Aristo" in this issue. It is a remarkable fact that out of thirty-eight entries for Association prizes, twenty-eight exhibits were made on American "Aristo," seven on albumen, two on gelatine paper, and one on platinum.

The above is certainly unquestionable evidence of the fact that American "Aristo" is the choice of progressive photographers.

Another important feature will be noticed in the advertisement referred to: The fact that out of fifteen prizes awarded by the Association, American "Aristo" captured eleven, albumen four, while gelatine papers got none.

RECENT PATENTS.

The following list of patents, relating to the photographic interests is specially reported by Franklin H. Hough, Solicitor of American and Foreign Patents, No. 925 F St. Washington, D. C.:

500,875.—Photographic roll holder. X. G. E. d'Eaucompre, Paris, France.

501,340.—Photographic gallery. E. Hackh, Stuttgart, Germany.

501,703.—Photographic camera. C. B. Withington, Jamesville, Wis.

501,866.—Photographic shutter. F. A. Brownell, assignor by mesne assignments to Eastman Kodak Co., Rochester, N. Y.

501,931.—Photographic camera. J. D. Garfield, Springfield, Mass.

502,188.—Photographic camera. C. G. Osteman, Boston, Mass.

502,857.—Photographic camera. F. A. Hetherington, assignor to United States Camera Co., Indianapolis, Ind.

502,799.—Photographic plate holder. C. B. Withington, Jamesville, Wis.

503,144.—Photographic washing apparatus. S. A. Kem and E. Frederick, Purcell, Ind. Ter.